



JAPANESE PATENT OFFICE

## PATENT ABSTRACTS OF JAPAN

(11) Publication number: 08254811 A

(43) Date of publication of application: 11.10.96

(51) Int. Cl. H01L 29/872

(21) Application number: 07067958

(71) Applicant: TOSHIBA CORP

(22) Date of filing: 27.03.95

(72) Inventor:  
USUI YASUNORI  
OTA TSUYOSHI  
KOTANI TOSHIYUKI

## (54) SCHOTTKY BARRIER DIODE

## (57) Abstract

**PURPOSE.** To increase the forward current by a method wherein the first conductivity type first semiconductor layer in low concentration is formed in a rugged shape on a semiconductor substrate to selectively form the first conductivity type second semiconductor layer in high concentration on the protrusion surfaces of the first semiconductor layer while forming a barrier metal on the surfaces of recession parts and protrusion parts.

**CONSTITUTION:** After the formation of the first N-semiconductor layer 2 on a semiconductor substrate 1, impurities e.g. phosphorus, etc., is diffused on the whole surface to form the second N<sup>+</sup> semiconductor layer 3. The trenches are ruggedly formed in the semiconductor layers 2, 3 to successively laminate a barrier metallic layer 4 of Au over the whole surface. By forming the barrier metal 4 only over the whole surface, an SBD in low Schottky barrier is formed in the protrusion of the first semiconductor layer 2 while another SBD in high Schottky barrier is formed on the side faces and bottom faces of the first semiconductor layer 2. Since the whole protrusion surface of the first semiconductor layer 2 becomes SBD in the low Schottky barrier, the forward current can run on the whole protrusion surface in case of the forward bias thereby enabling said current to increase.

COPYRIGHT: (C)1996 JPO

